CLAIMS

What is claimed is:

1. An optical modulator comprising:

a substrate having an upper surface and a ridge protruding above said upper surface, said ridge extending to a height above said upper surface;

an optical waveguide formed within said substrate, at least a portion of which is formed within said ridge;

a dielectric layer formed on said upper surface of said substrate, said dielectric layer having a height less than or equal to the height of said ridge; and

an electrode formed above said dielectric layer and located adjacent to said ridge.

- 2. An optical modulator according to claim 1, wherein: the height of said dielectric layer is equal to the height of said ridge; and a portion of said electrode contacts an upper surface of said ridge.
- 3. An optical modulator according to claim 1, wherein: the height of said dielectric layer is less than the height of said ridge; and said electrode includes a lower surface located below an upper surface of said ridge.
 - 4. An optical modulator according to claim 3, wherein: said ridge includes a sidewall; and a portion of said electrode contacts said sidewall of said ridge.
- 5. An optical modulator according to claim 1, wherein: said substrate is formed from a material having a first dielectric constant; and said dielectric layer is formed from a material having a second dielectric constant that is less than said first dielectric constant.

- 6. An optical modulator according to claim 5, wherein said substrate is formed from lithium niobate crystal.
- 7. An optical modulator according to claim 6, wherein said dielectric layer is formed from SU-8.
 - 8. An optical modulator comprising:

a substrate having an upper surface, a first ridge protruding above said upper surface, and a second ridge protruding above said upper surface;

an optical waveguide formed within said substrate, said optical waveguide having a first arm, at least a portion of which is formed within said first ridge, and a second arm, at least a portion of which is formed within said second ridge;

a dielectric section formed on said upper surface of said substrate between said first ridge and said second ridge; and

an electrode formed above said dielectric layer.

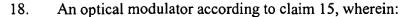
- 9. An optical modulator according to claim 8, wherein: said substrate is formed from a material having a first dielectric constant; and said dielectric section is formed from a material having a second dielectric constant that is less than said first dielectric constant.
- 10. An optical modulator according to claim 8, wherein said electrode is located adjacent to said first ridge.
- 11. An optical modulator according to claim 10, wherein said electrode is located adjacent to said second ridge.
 - 12. An optical modulator according to claim 8, wherein:

said first ridge extends to a first height above said upper surface of said substrate;

said second ridge extends to a second height above said upper surface of said substrate; and

said dielectric layer extends to a third height above said upper surface of said substrate, said third height being less than or equal to said first height and less than or equal to said second height.

- 13. An optical modulator according to claim 12, wherein said first height and said second height are equal.
- 14. An optical modulator according to claim 8, wherein said first ridge and said second ridge are parallel.
 - 15. An optical modulator comprising:
- a substrate having an upper surface and a ridge protruding above said upper surface, said ridge dividing said upper surface into a first area and a second area;
- an optical waveguide formed within said substrate, at least a portion of which is formed within said ridge;
- a first dielectric section formed on said first area of said upper surface, said first dielectric section having a height less than or equal to the height of said ridge;
- a second dielectric section formed on said second area of said upper surface, said second dielectric section having a height less than or equal to the height of said ridge;
 - a first electrode formed above said first dielectric layer; and a second electrode formed above said second dielectric layer.
- 16. An optical modulator according to claim 15, wherein said first electrode and said second electrode are each located adjacent to said ridge.
- 17. An optical modulator according to claim 15, wherein said first electrode is a drive signal electrode and said second electrode is a ground electrode.



said substrate is formed from a material having a substrate dielectric constant; said first dielectric section is formed from a material having a dielectric constant that is less than said substrate dielectric constant; and

said second dielectric section is formed from a material having a dielectric constant that is less than said substrate dielectric constant.

19. An optical modulator comprising:

a substrate having an upper surface, a first ridge protruding above said upper surface, and a second ridge protruding above said upper surface, said first and second ridges dividing said upper surface into a first area between said first and second ridges, a second area adjacent to said first ridge, and a third area adjacent to said second ridge;

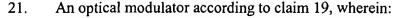
an optical waveguide formed within said substrate, said optical waveguide having a first arm, at least a portion of which is formed within said first ridge, and a second arm, at least a portion of which is formed within said second ridge;

a first dielectric section formed on said first area of said upper surface; a second dielectric section formed on said second area of said upper surface; a third dielectric section formed on said third area of said upper surface; a first electrode formed above said first dielectric section; a second electrode formed above said second dielectric section; and a third electrode formed above said third dielectric section.

20. An optical modulator according to claim 19, wherein:

each of said first and second ridges extends to a height above said upper surface of said substrate; and

each of said first, second, and third dielectric sections has a height less than the height of said first and second ridges.



each of said first and second ridges extends to a height above said upper surface of said substrate; and

each of said first, second, and third dielectric sections has a height equal to height of said first and second ridges.

22. An optical modulator according to claim 19, wherein:

said substrate is formed from a material having a substrate dielectric constant; and

each of said first, second, and third dielectric sections is formed from a material having a dielectric constant less than said substrate dielectric constant.

- 23. An optical modulator according to claim 19, wherein said first electrode is a drive signal electrode and each of said second and third electrodes is a ground electrode.
- 24. An optical modulator according to claim 23, wherein said first, second, and third electrodes are configured as a coplanar waveguide transmission line.